

ASSESSMENT OF THE GEOLOGY AND COPPER
POTENTIAL FOR
MATEMBO-IRINGA



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INTRODUCTION

Copper is an element and has the symbol Cu. It is a ductile, soft, malleable and has high thermal and electrical conductivity. The exposed surface of copper takes on a reddish-orange tarnish. Today it is widely used as heat and electricity conductor, as construction material in buildings, and in different metal alloys.

The copper metal and its alloys have been widely used for many decades now. Chalcopyrite and malachite are known to be the biggest ores of copper. Today, copper is mined throughout the world. The largest man-made excavations in the world are known to be the open pit mines.

Since 1950 the demand for copper has increased at an average rate of 4% per year. For the next ten years growth in copper demand is expected to exceed this, mainly due to the expansion of the Chinese economy and the quensequent growth in stainless steel demand in China. Currently China account for about 70% growth in Copper demand worldwide.

Most of the copper production has come from sulphides ores. During the next ten years copper production from the sulphides is expected to grow.

OBJECTIVE

The objectives of the report is to investigate with due diligence, assess the alteration, mineralization and geological setup, of the pronounced property favorable for the occurrence of copper ore mineralization as the author spend almost one day within the known Mtembo copper occurances.

LOCATION AND ACCESSIBILITY

Matembo copper occurrence is located about 30Km north of Iringa town in southern highland of Tanzania, within Qds 215/1. The project is bounded by the following coordinates (ARC 1960,36S) covering a total area of about 2 square kilometres

Order	Long Deg	Long Min	Long Sec	N/S	Lat Deg	Lat Min	Lat Sec	E/W
A	35	37	5.2	S	07	31	57.50	E
B	35	38	8.4	S	07	31	57.50	E
C	35	38	8.4	S	07	32	18.00	E
D	35	38	24	S	07	32	18.00	E
E	35	38	24	S	07	32	30.00	E
F	35	37	36.8	S	07	32	30.00	E
G	35	37	36.8	S	07	32	24.30	E
H	35	37	5.2	S	07	32	24.30	E

The concession is accessible throughout the year as the Iringa-Dodoma tarmac road is under constructions. Regionally the property lies within known active artisanal copper mines(Primary Mining Licence)

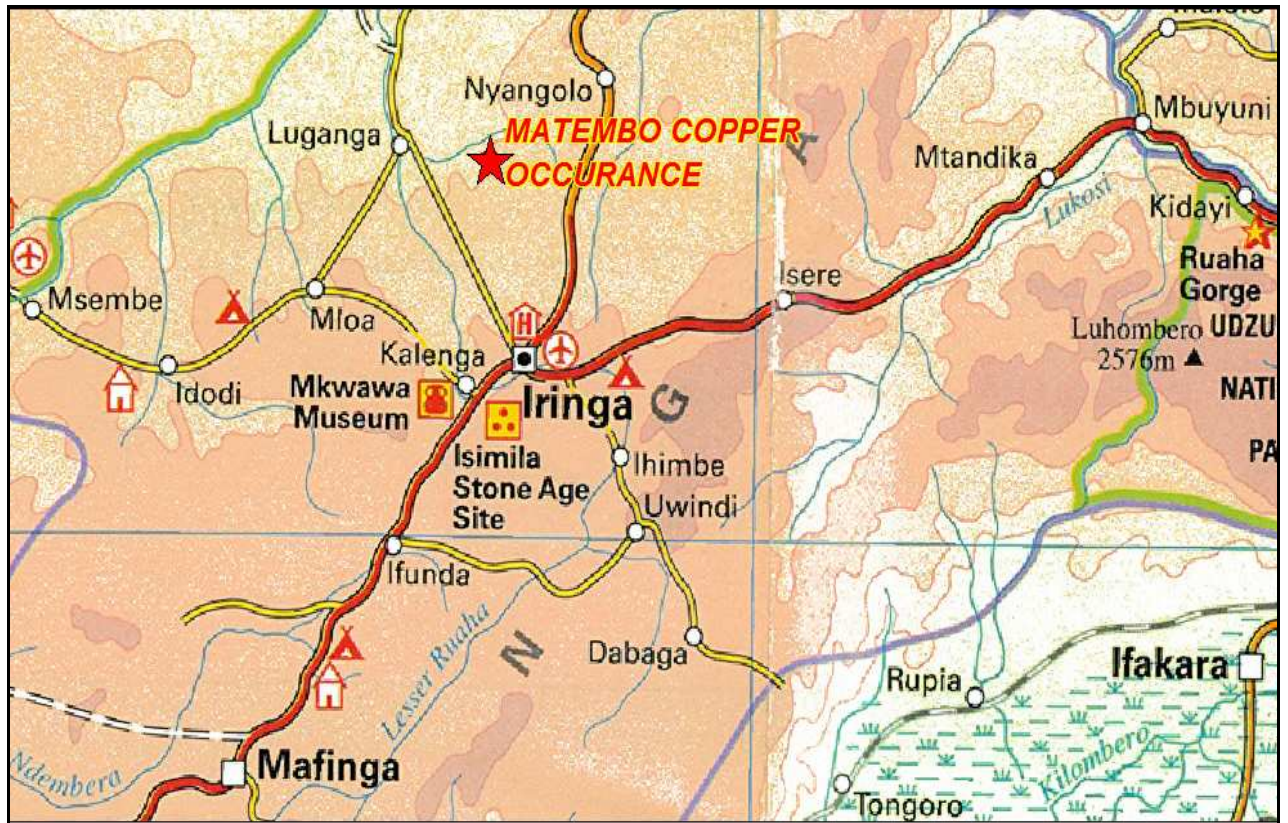


Fig2; Project Location map

PREVIOUS WORK DONE

The area has been mapped regionally by Geological Survey of Tanzania (government agency) the recent detailed information resulted into numerous occurrences and deposit of copper revealed to be of economical importance. Ground geophysical survey which lead to subsurface drilling diamond drilling has been conducted on the area, the data is still pending

REGIONAL GEOLOGY

Precambrian country rocks of around Iringa are all of metamorphic aspects, differing widely in lithology, metamorphic grade, and degrees of migmatizations and cataclasis. Main structural trend are North-East, they swing due East. Rocks of high metamorphic grade were probably metamorphosed and migmatized before

metasedimentary and metaigneous rocks were formed. It is suggested that after the formation of the latter, the whole area was subjected to folding, metamorphism and migmatizations during the post Ndembera orogeny. Cataclasis took place after migmatizations and granites appear to have been associated with the later stages of post Ndembera orogeny.

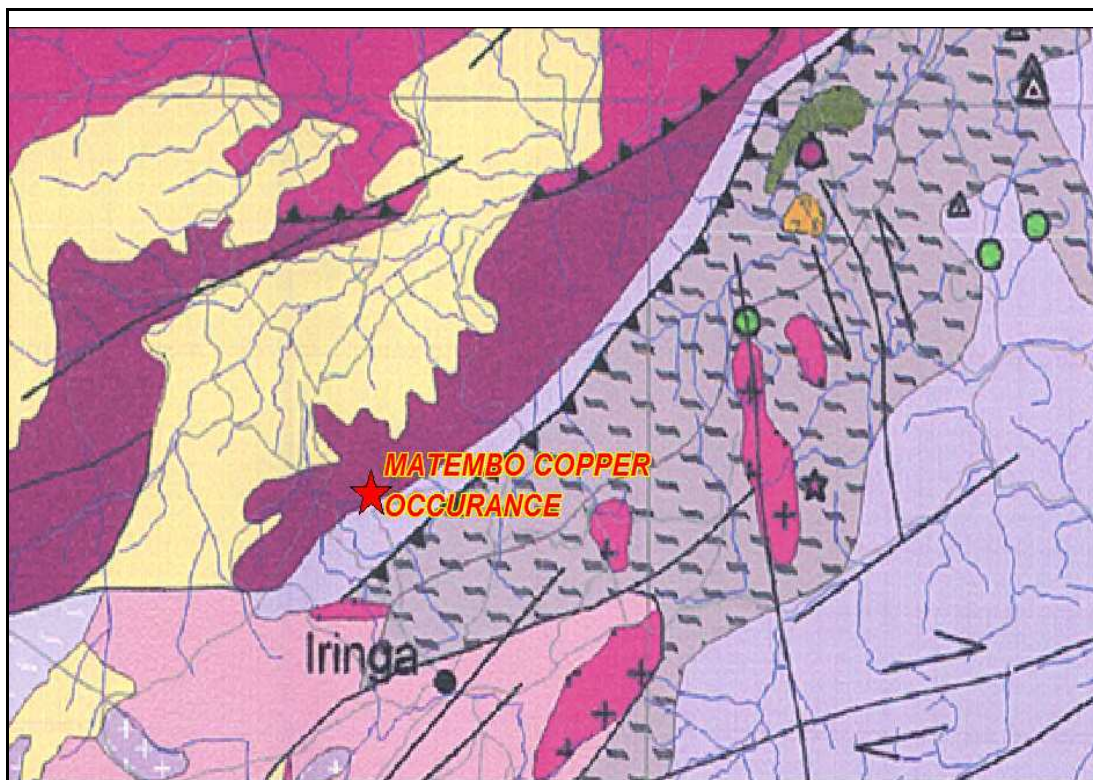


Fig 3; Regional Geology

Legend

- ★ Matembo Copper deposit
- Cu Copper
- Neoproterozoic high-grade mafic and felsic granulite, gneiss and migmatite (ca. 640 Ma granulite-facies metamorphism, NP2-NP3), interlayered with amphibolite, marble, quartzite, schist and mylonite (Neoproterozoic Mozambique Belt).
Protoliths of the high-grade rocks are mostly of Meso to Neoproterozoic (MP3 - NP1-2) ages, with scarce Archaean to Palaeoproterozoic xenocrysts
- Palaeoproterozoic (Usagaran, PP1-3) meta-sediments, orthogneiss, granulite, metagabbro, amphibolite, marble and eclogitic lenses (Isimani Group)
- Mesoarchaeoan orthogneiss (TTG), migmatite, granite (Isangan Group : ca. 3.0-2.85 Ga)

LOCAL GEOLOGY

The area is covered by amphibolites striking in different orientation from NW-SE dipping SW to E-W dipping generally to south, occasionally the units strike deviate to North-South, these metasediment are massive to partly sheared with strong carbonate and minor silicification alteration in place. Mafic to intermediate dyke along and across general foliation are particularly common.

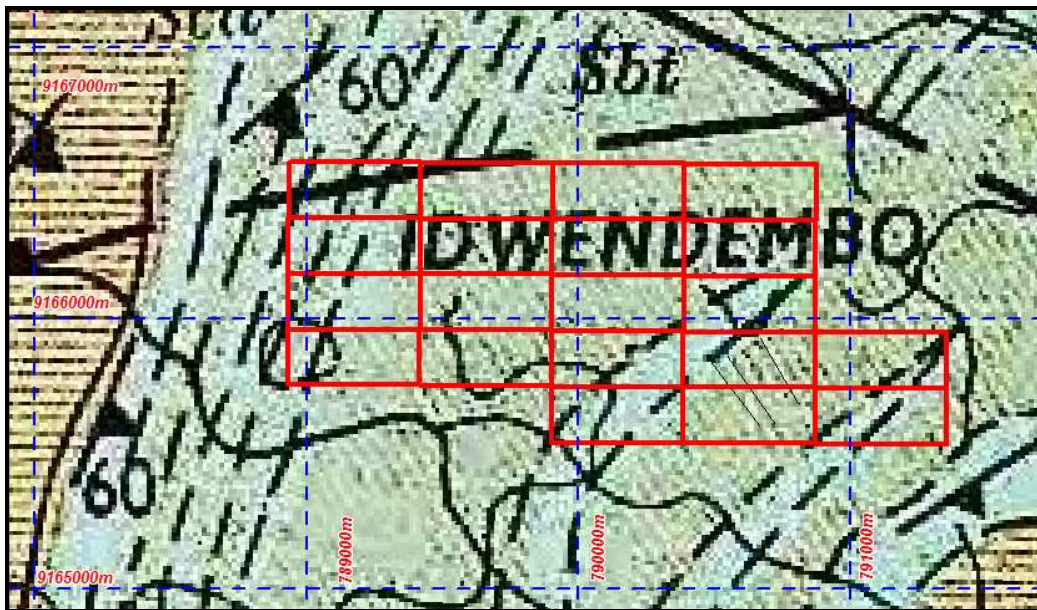


Fig4 Project Local geology map

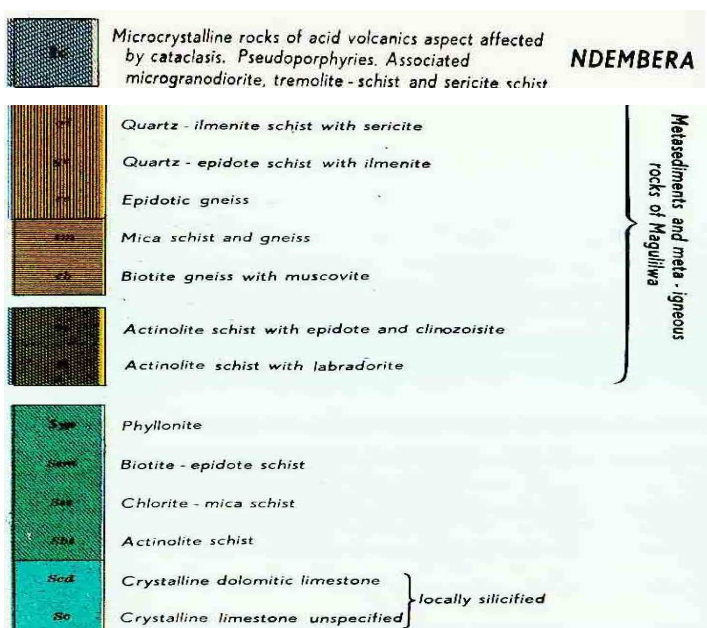




Fig5, Sheared metasediment striking almost E-W at 790326E/9165956N (Looking West)



Fig6, mafic dyke along foliated metasediment in different dipping directions

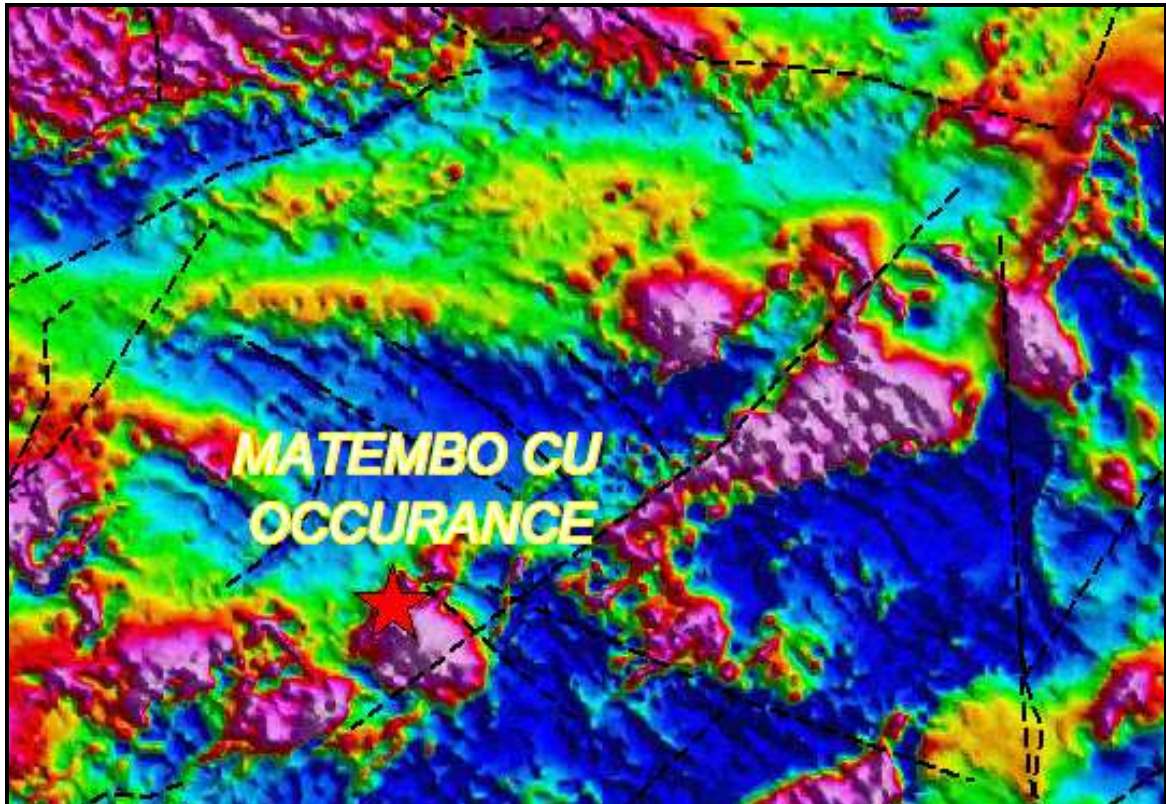


Fig 7;Matembo copper deposit in relation to airborne magnetic map

MINERALIZATION

The mineralized zone seems to be shear hosted within amphibolites; However mineralization is associated with quartz carbonate flooding with chlorite alteration in these sheared metasediments. Copper mineralization between 10-20% predominantly composed of malachite and azurite with vein up to 1.0m wide and is visually distinguishable from barren zones. The copper deposit may be the consequence of hydrothermal fluid wall-rock alteration possibly from subsurface intrusive body. The brittle ductile vertical shear zone seems to have acted as fluid plumbing system as can easily be seen from mineralized hanging wall.

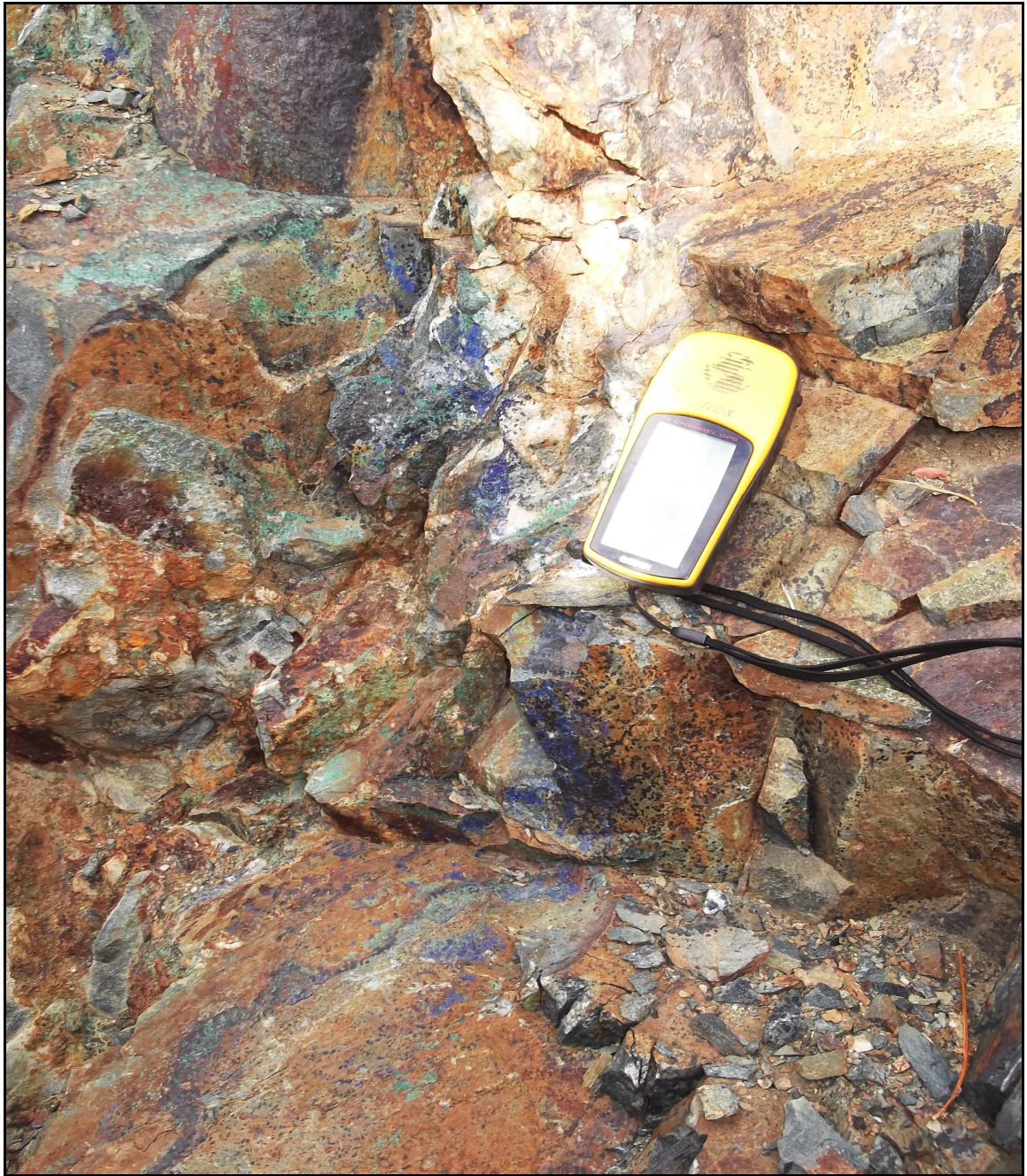


Fig8, Malachite and azurite mineralization along moderately sheared amphibolite



Fig9. Strongly sheared zone with substantial copper percentage

This vertical shear with a strike length of several hundred meters and a width of about 0.5-1m. The shear zone rocks are light-brown colored very fine grained rocks that have in part been crushed, sheared or brecciated, forming a zone permeable to mineralizing solutions(?gossaneous) see **fig** . The mineralized areas in the shear zone are irregular in shape and in distribution. Rich ore was met at a depth of 40 and 80m levels below which only primary sulphides occurs.



Fig10. Vertical multiple copper veins of varying width up to 50cm, *right*; taking samples



Fig11. Sorting copper ore

Fresh pyrites

Azurite

Malachite



Fig12. Gold Mineralized quartz vein along strongly sheared metasediment revealed 0.3g/t



Fig13. Vertical Diamond drilled hole with 50m deep at location 790726E/9166156N

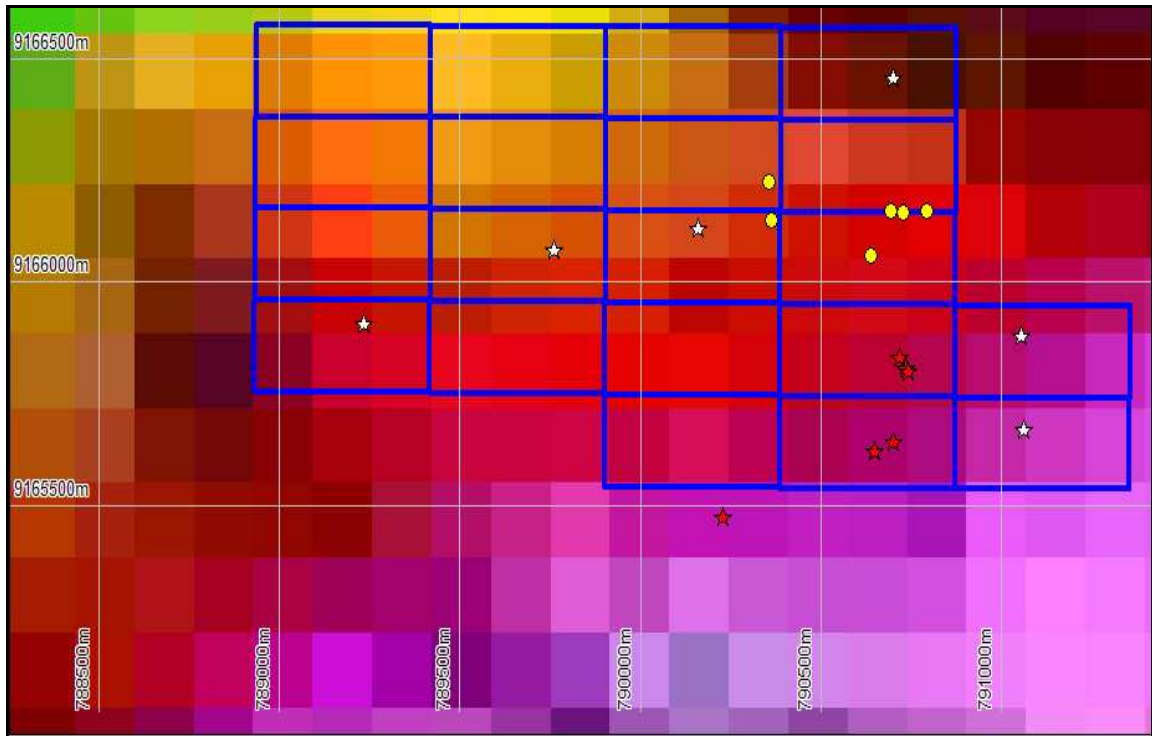


Fig14. Proposed plan pitting plan map

☆ Proposed copper pitting locations

★ Active copper mine

● Proposed Diamond Drilling position (Pad)

LONGITUDE			LATITUDE		
Deg	Min	Sec	Deg	Min	Sec
35	37	15	-7	32	19.33
35	37	32	-7	32	13.76
35	37	45	-7	32	12.21
35	37	2.67	-7	32	1.07

Proposed reconnaissance pitting position based on field observation

LOCATION	EASTING	NORTHING
PAD1	790636	9166058
DRILLED POINT	790726	9166156
PAD3	790791	9166158
PAD4	790691	9166160
PAD5	790355	9166224
PAD6	790361	9166140

Pads location before drilling commence

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Plot No. 1129
Chole Road, Masaki
P.O. Box 23400
DAR ES SALAAM

TEST REPORT

Client: FESTO NGOZI
Address of Client: Dar es Salaam
Sample Type: Rock
Site and position sampled: Not stated
Sampling plan: Not stated
Date of Sampling: Not stated
Date received: 09/09/2014
Date started: 10/09/2014
Date Completed and Reported: 10/09/2014
Test Method: XRF Technique

INTRODUCTION

Two rock samples were submitted to TMAA Laboratory by Festo Ngozi for testing Copper and other minerals content. The sample was given laboratory code number 3FN-01 and 3FN-02.

ATTENTION

This test report pertains only to the samples brought to TMAA Laboratory for analysis and not to any other sample(s) of similar nature. The results should not be regarded as the representative of the quality of any commercial consignment or be used for any commercial negotiations.

TEST RESULTS

S/N	Client code No.	Lab Code No	Wt (g)	Cu (%)	Fe (%)
1	MAT 1	3FN-01	796	8.62	13.63
2	MAT 2	3FN-02	2338	10.07	14.34

Note: Cu=copper, Fe=iron

Comments

The given results are for the information only.

Analysed by:

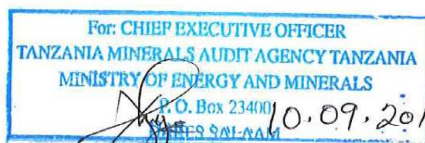
Amini Elisante

Checked by:

Soromen Asantumbi

Approved by:

George Kaseza



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Chole Road, Masaki
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DAR ES SALAAM

TEST REPORT

Client: FESTO NGOZI
Address of Client: Dar es Salaam
Sample Type: Rock
Site and position sampled: Not stated
Sampling plan: Not stated
Date of Sampling: Not stated
Date received: 09/09/2014
Date started: 19/09/2014
Date Completed and Reported: 19/09/2014
Test Method: Fire Assay with AAS finish

INTRODUCTION

One rock sample MAT3, weighing 2462g was submitted to TMAA Laboratory by Festo Ngozi for testing Gold content. The sample was given laboratory code number 4FN-03.

ATTENTION

This test report pertains only to the samples brought to TMAA Laboratory for analysis and not to any other sample(s) of similar nature. The results should not be regarded as the representative of the quality of any commercial consignment or be used for any commercial negotiations.

TEST RESULTS

S/N	Client code No.	Lab Code No	Au (g/t)
1	MAT 3	4FN-03	0.30

Note: Au = Gold,

Comments

Above results are meant for the information only.



Analysed by: *Anthony Kusaga* *19/09/2014*

Checked by: *Andrew Mwachaga* *19/09/2014*

Approved by: *Mwumiwa Mwaraka* *19/09/2014*

1 of 1

TONNAGE CALCULATIONS

Volume=Area * depth

=width*length*depth

=0.5*1000m*80m (maximum depth before primary sulphides)

4*10000m cubic

weight=density* volume

40000*8940

0.1 *3776*10⁵ =3776*10⁴ =37760TONNES

RECOMMENDATION

The opened pit mine is characterized by mineralized structural setting, alterations and minor sulfidation related to copper mineralization.

-Since the detailed ground magnetic surveyed has been done to reveal potential target for diamond drilling, it is strongly suggested that first phase of pitting should be done over the prepared pads. *See fig 14*

-Detailed structural mapping over the entirely project should be done so as to identify other targets for trenching in which good intersection zone will result into immersing copper production pit

-The use of Omega Handheld XRF Analyzer (Niton gun) to confirm high grade copper ore with substantial percentage at both hanging and footwall.

CONCLUSION

With regards to the quality and quantity of the copper about 38000tonnes it is no doubt that the deposits are quantified for economic mine whereas substantial gold mineralization associated with copper can possibly being mined as by product and can be monitories based on current world market price.

Regional copper endowments including copper occurrences within the area, are advantageous criteria to discover world class economic copper mine project.

